Classification in the Department of Energy

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WHAT IS CLASSIFICATION?

- The process of identifying information we need to protect in the interest of national security
- Not the marking of documents
- Not the security of documents

CLASSIFICATION LEVELS

- Top secret (TS) - release can cause extremely grave damage to national security
- Secret (S) - serious damage
- Confidential (C) - damage

CLASSIFICATION CATEGORIES

- Restricted Data (RD)
- Formerly Restricted Data (FRD)
- National Security Information (NSI)

OTHER TYPES OF CONTROLLED INFORMATION

- Unclassified Controlled Nuclear Information (UCNI)
- Official Use Only (OUO) - exempt from freedom of information act for specific reasons only

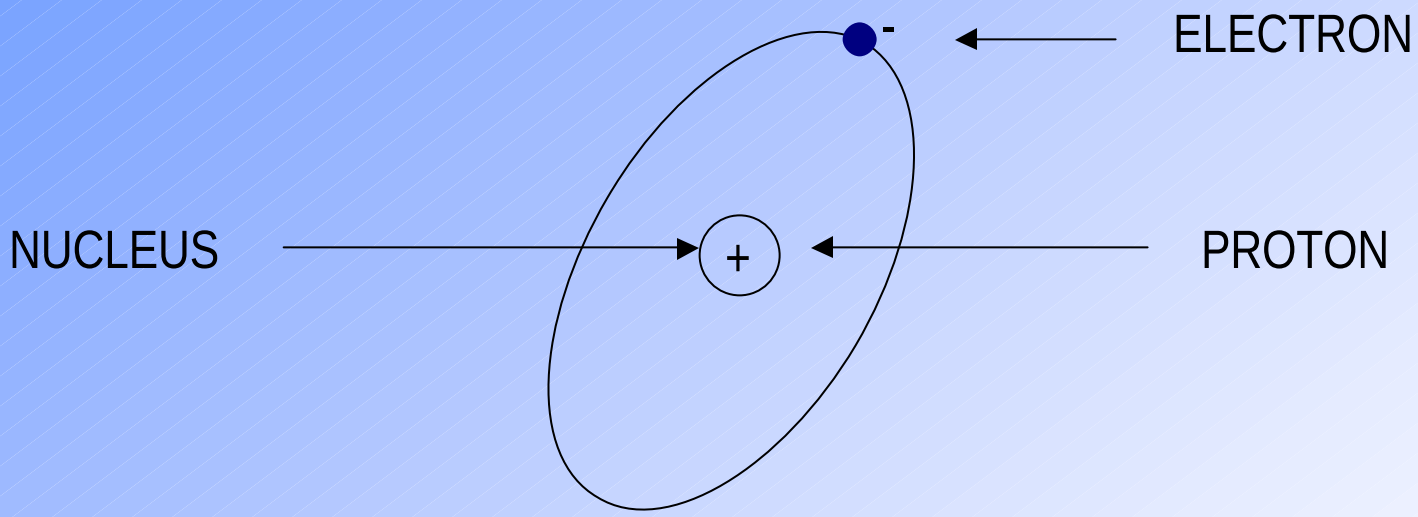
RESTRICTED DATA

- Under authority of Atomic Energy Act
- Design, manufacture or utilization of atomic weapons
- Production of special nuclear material
- Use of special nuclear material in the production of energy

RESTRICTED DATA (continued)

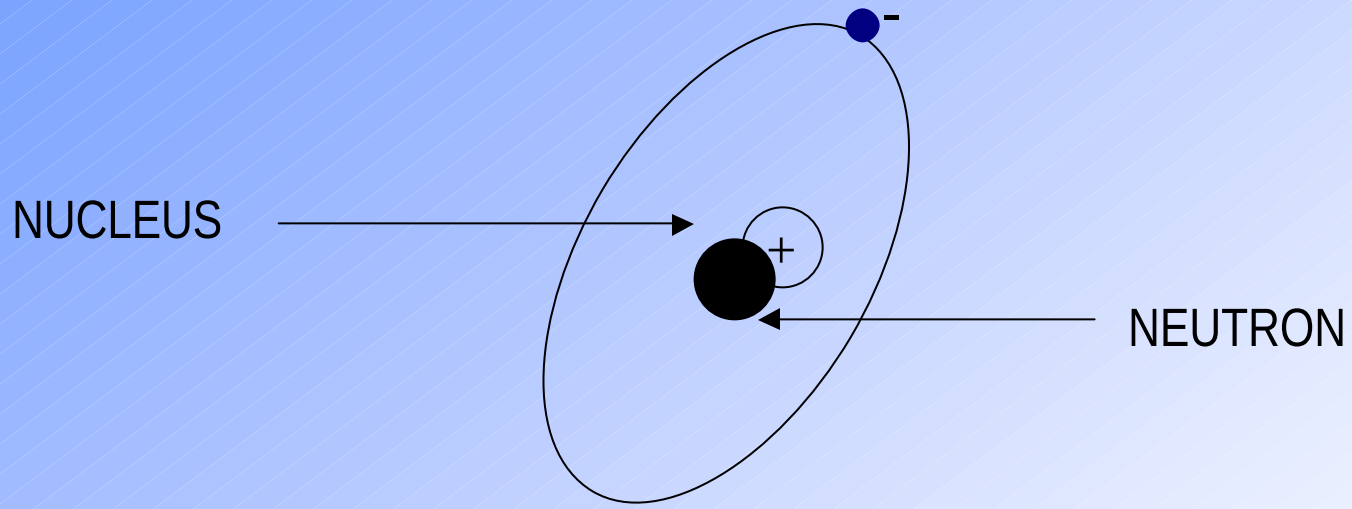
- But not data declassified or removed from RD category
- All RD is born classified unless already declassified or transclassified to FRD
- Declassified only by Secretary of Energy

MODEL OF THE ATOM



HYDROGEN - SIMPLEST ATOM

SYMBOL	-	$_1H^1$
LOWER 1	-	NUMBER OF CHARGES IN NUCLEUS
UPPER 1	-	TOTAL MASS OF ATOM
	-	ELECTRON NEARLY WEIGHTLESS
H	-	STANDS FOR HYDROGEN



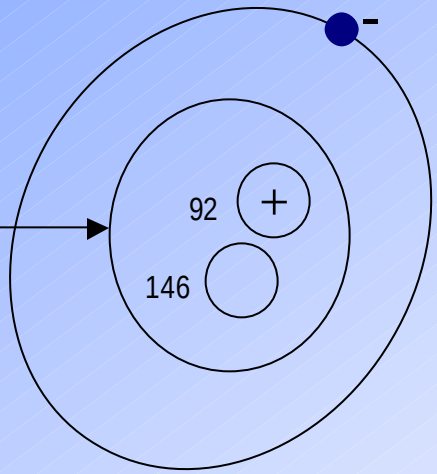
DEUTERIUM - LIKE HYDROGEN, BUT HAS AN EXTRA UNCHARGED PARTICLE IN NUCLEUS

NEUTRON - UNCHARGED PARTICLE, ABOUT THE SAME WEIGHT AS A PROTON

DEUTERIUM IS CALLED AN ISOTOPE OF HYDROGEN

SYMBOL - $_1H^2$

URANIUM ATOM

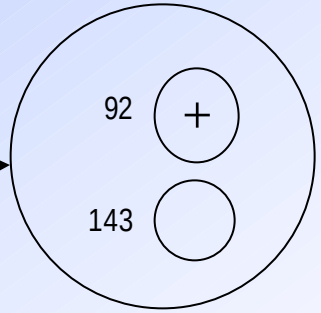


92 ORBITING ELECTRONS

NUCLEUS

SYMBOL $_{92}U^{238}$

AN IMPORTANT ISOTOPE OF URANIUM $_{92}U^{235}$



NUCLEUS

92 ORBITING ELECTRONS

URANIUM

- In nature, uranium is 99.3% U-238 and only 0.7% U-235.
- Separating U-235 from U-238 is possible by several processes. These processes are technically difficult and expensive
- Uranium in which the percentage of U-235 is greater than 0.7% is called enriched uranium. Enriched uranium is special nuclear material.

SPECIAL NUCLEAR MATERIAL

- Enriched uranium
- Plutonium
- Uranium-233

PRODUCTION OF SPECIAL NUCLEAR MATERIAL

- Processes to enrich uranium
- Processes to produce and separate plutonium

USE OF SPECIAL NUCLEAR MATERIAL IN THE PRODUCTION OF ENERGY

- Naval propulsion reactors
- Space power reactors
- Electricity production (mostly declassified)

ATOMIC WEAPONS

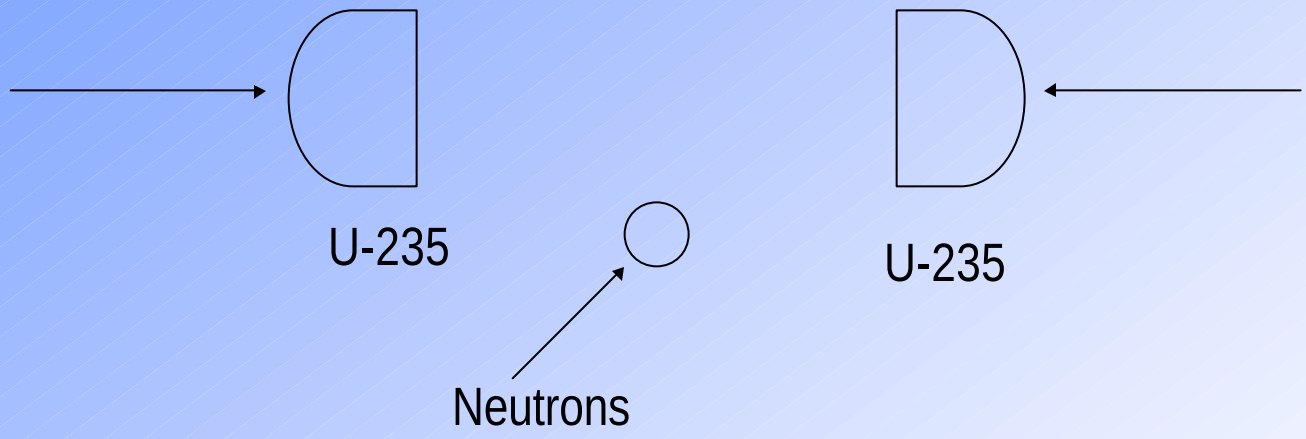
Energy of the explosion derived from

fission of enriched uranium or plutonium

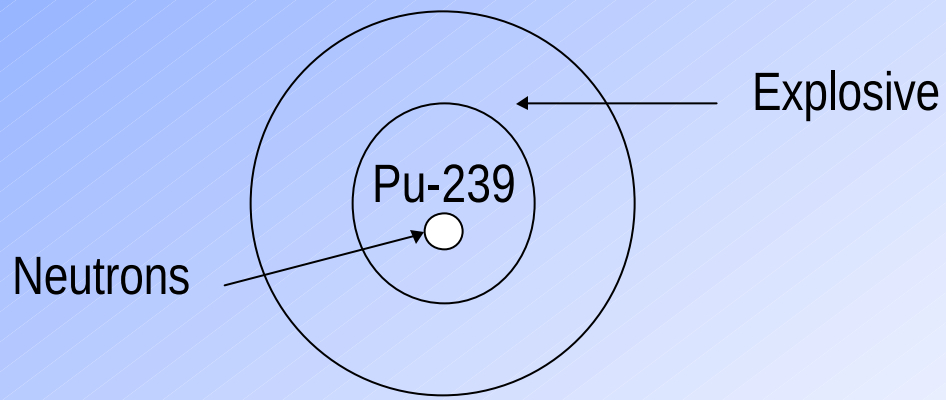
Basics

- High purity SNM
- Critical mass - sufficient quantity to chain react
- Rapid assembly - using explosives
- Long enough containment
- Reliable source of neutrons for initiation
- Associated circuitry and components for assembly, initiation, etc.

GUN ASSEMBLY



IMPLOSION ASSEMBLY



FUSION WEAPONS

ENERGY DERIVED FROM FUSSION OR JOINING OF LIGHT ELEMENTS

$$ {}_1H^2 + {}_1H^3 \Rightarrow {}_2He^4 + {}_0n^1 + \text{ ENERGY} $$

DEUTERIUM + *TRITIUM* $\Rightarrow$ HELIUM + NEUTRON

HYDROGEN ISOTOPES

THEORETICAL BASIS FOR HYDROGEN BOMB

FUSION OR THERMONUCLEAR WEAPONS

- To initiate fusion you need extremely high pressures and temperatures. Temperatures about 10 million ºF, pressures about 1000 billion psi.
- On earth only an atomic bomb can provide the energy to create these temperatures and pressures.
- Nearly all technical details of fission and fusion weapons are classified as restricted data.

FORMERLY RESTRICTED DATA

- Under authority of Atomic Energy Act
- Related primarily to the utilization of atomic weapons
- Examples
  - Stockpile quantities
  - Weapons safety and storage
  - Yields
  - Locations deployed
- Downgrading or declassification requires joint approval of DOE and DOD

NATIONAL SECURITY INFORMATION

- Under authority of Executive Order 12958 (effective 10/95)

To be classified NSI must concern:

- Military plans, weapons, or operations
- Foreign government information
- Vulnerabilities or capabilities of national security projects, facilities
- Intelligence activities, sources, cryptology
- Foreign relations or foreign activities of the US, including confidential sources
- Scientific, technical, or economic matters relating to national security

NATIONAL SECURITY INFORMATION (continued)

- US government programs for safeguarding nuclear materials and facilities

- Date or event must be specified for when document becomes unclassified
- Date or Event must be within 10 years unless exempted for one of 8 reasons
  - Reveal intelligence source, method, cryptologic system
  - Reveal information concerned with development or use of weapons of mass destruction
  - Reveal information that would impair use of technology in a US weapons system
  - Reveal US military or national security emergency plans

NATIONAL SECURITY INFORMATION (continued)

- Reveal foreign government information
- Damage US relations with other governments
- Impair the ability to protect the President, Vice President, others
- Violate a statute, treaty, or agreement

■ Document must be portion marked, showing classification level for each paragraph, section, table, figure, etc.

AUTHORIZED CLASSIFIERS

- Derivative classifiers
  - Use guides or source documents
- Original classifiers
  - Use guide or source documents
  - May originally classify NSI from Executive Order 12958

CATEGORY SUMMARY

- RD
  - Born classified, always derivatively from Atomic Energy Act, or guide or source document, declassification only by DOE
- FRD
  - Transclassified from RD, always derivatively from AEA, guide, source document, declassification jointly by DOE and DOD
- NSI
  - Classified by Executive Order (not automatic or born), may be derivatively or originally classified, declassified by date or event. Automatically in 10 years or exempted from declassification. Portion marked to show classification level (U, C, S, TS) of each paragraph, section, etc.

DOE GUIDES

- All guides approved by DOE Headquarters classification
- Policy guides - DOE Headquarters
- Program guides
- Local guides - local DOE operations office, contractor organizations